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EXAMINER	
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SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/23/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/757,104	ANDERSON ET AL.	
	Examiner	Art Unit	
	William L. Boddie	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-62 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-62 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1. In an amendment dated, February 1st, 2007, the Applicant amended claim 14. Currently claims 1-62 are pending.

Response to Arguments

2. Applicant's arguments filed February 1st, 2007 have been fully considered but they are not persuasive.

3. Specifically, on pages 19 and 26-29 of the Remarks, the Applicants argue that Hung does not disclose a diffractive light device.

The Examiner respectfully disagrees. The Applicants' have chosen to define a DLD as "broadly understood as any device or structure the produces color by controlling the gap size between a reflective surface and one or more charge plates by balancing two forces: electro-static attraction based on voltage and charge on the plates, and a spring constant of one or more "flexures" supporting the reflective surface" (para. 16). Hung appears to satisfy this definition. Hung controls the gap size (mirror height) between a reflective surface (184 in fig. 21) and one or more charge plates (190 in fig. 21 for example) by balancing electro-static attraction and a spring constant supporting the reflective surface (col. 6, line 63 – col. 7, line 5). Furthermore the wavelength of light output by Hung's invention is directly dependent upon the gap size (col. 27, lines 16-19; for example).

As such the Examiner sees no reason why Hung cannot be seen as a DLD as it has been defined by the Applicants.

4. The Applicants further traverse the rejection of claims 1 and 13, on pages 20 and 25, claiming that the portion of Hung's device (30 in fig. 1b), which the Examiner has mapped to a "pixel plate", has nothing to do with a DLD.

Again the Examiner respectfully disagrees. Figure 1b was cited by the Examiner in an attempt to better illustrate how the invention of Hung was being applied to the rejection of the claims. A more detailed picture of the figure 21 device can be found in figure 22. From figure 22, the pixel plate of the Applicants invention is seen as elements, 230, 222, 228 and 213-214. This disclosure of structure is seen by the Examiner to sufficiently describe a "pixel plate" as required by the current claim.

5. Applicant's arguments traversing the rejections of claims 23, 30, 39, 61 and 62 are persuasive. Upon further examination, new grounds of rejection have been made.

6. On pages 22-23 of the Remarks the Applicants traverse claim 3, on the grounds that Hung does not disclose a pixel plate. The Applicants are pointed to the above discussion of Hung.

7. On page 23 of the Remarks the Applicants argue that McCartney cannot teach "an uncompensated digital color count" as required by claim 6, because such a feature is only in a DLD. The Examiner respectfully disagrees. A reasonable interpretation of "digital color count" would include a piece of digital data (command word of McCartney) that contains color data. Furthermore the data has yet to be compensated by temperature data, and thus fulfills the remaining limitation of the phrase. Simply, the Examiner sees no reason why an uncompensated command word does not satisfy the

broadest reasonable interpretation of "uncompensated digital color count." As such the rejection is maintained.

8. On page 24 of the Remarks, the Applicants again claim that "color voltage bias" is only found in a DLD and as such can be included in the invention of McCartney. Again the Examiner respectfully disagrees. The phrase color voltage bias is a very broadly worded phrase and can reasonable be seen to include structure of a LCD panel as described by McCartney.

9. Applicants' arguments not addressed above are seen as mute due to the new grounds of rejections applied below.

Claim Rejections - 35 USC § 101

10. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

11. Claims 50-54 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

12. The Applicants are specifically pointed to pages 53-54 of the Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility. In part these guidelines require that for computer programs to be seen as statutory, they must be instructions, on a computer-readable medium, that are executable by a computer.

Claim Rejections - 35 USC § 112

13. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

14. Claims 50-54 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. There is no mention of a processor readable medium or what such a medium entails in the specification.

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

16. Claims 1, 12-13, 24, 31 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hung et al. (US 6,329,738) in view of Romo et al. (US 7,197,225).

With respect to claim 1, Hung discloses, a diffractive light device (DLD) (figs. 21-22) comprising:

a substrate (14 in fig. 1b);

a force plate (32 in fig. 1b) disposed on said substrate, said force plate configured to produce an electrostatic force in response to an applied voltage (col. 8, lines 62-65);

a pixel plate (30 in fig. 1b) disposed adjacent to said force plate, wherein a position of said pixel plate is partially set by a flexure (26a/b in fig. 1b) coupled to said pixel plate.

While Hung compensates for differences in pixel plate length by increasing the actuation force (col. 14, lines 11-14), Hung does not expressly disclose compensating the DLD for temperature variations.

Romo discloses, a temperature sensor (708 in fig. 12) thermally coupled to an optical MEMs device (fig. 3, for example), wherein said temperature sensor is configured to produce a temperature compensated voltage in response to a thermal measurement performed by said temperature sensor (col. 9, line 66 – col. 10, line 4)

Hung and Romo are analogous art because they are both from the same field of endeavor namely optical MEMS devices operating using electrostatic attraction.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the temperature sensor and compensation means of Romo in the DLD device of Hung.

The motivation for doing so would have been to overcome temperature dependent instabilities (Romo; col. 1, lines 46-48).

With respect to claim 12, the only difference between claim 12 and claim 1 is the device is a MEMS device instead of a DLD device. As Hung is clearly a MEMS device claim 12 is rejected on the same merits shown above in the rejection of claim 1. Romo further discloses, adjusting the electrostatic force in response to a measured temperature (col. 4, lines 23-27; col. 9, line 66 – col. 10, line 4).

With respect to claim 13, Hung and Romo disclose, a MEMS of claim 12 (see above).

Hung further discloses, a support post (216 in fig. 22) extruding from said substrate; and

a flexure (26a/b in fig. 1b for example) coupling said pixel plate (30 in fig. 1b) to said support post (28a/b in fig. 1b), wherein said flexure is configured to exert a spring force on said pixel plate opposing said electrostatic force (col. 6, line 63 – col. 7, line 4); said spring force predictably varying with a variation in temperature (col. 14, lines 11-14, discloses, compensating for increased spring force).

With respect to claim 24, Hung discloses, an image display device comprising:

a system controller (col. 27, lines 5-34);

a variable voltage source communicatively coupled to said system controller (18 in fig. 1b); and

an array of DLDs communicatively coupled to said variable voltage source, each DLD of said DLD array including a substrate (14 in fig. 1b),

a force plate disposed on said substrate (32a/b in fig. 1b), said force plate configured to produce an electrostatic force in response to a voltage applied by said voltage source (col. 8, lines 62-65),

a pixel plate disposed adjacent to said force plate (30 in fig. 1b), wherein a position of said pixel plate is partially determined by a flexure coupled to said pixel plate (26a/b in fig. 1b).

While Hung compensates for differences in pixel plate length (col. 14, lines 11-14), Hung does not expressly disclose compensating the DLD for temperature variations.

Romo discloses, a temperature sensor (708 in fig. 12) thermally coupled to an optical MEMs device (fig. 3, for example), wherein said temperature sensor is configured to produce a temperature compensated voltage in response to a thermal measurement performed by said temperature sensor (col. 9, line 66 – col. 10, line 4)

Hung and Romo are analogous art because they are both from the same field of endeavor namely optical MEMS devices operating using electrostatic attraction.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the temperature sensor and compensation means of Romo in the DLD device of Hung.

The motivation for doing so would have been to overcome temperature dependent instabilities (Romo; col. 1, lines 46-48).

With respect to claim 31, the only difference in scope between claim 31 and claim 1, is the replacement of force plate, pixel plate and temperature with "means for" language. As shown above in the rejection of claim 1, the means provided by Hung, and Romo are seen as sufficiently equivalent to the Applicant's disclosed structure to satisfy the "means for" language of claim 31. For this reason, claim 31 is rejected on the same merits shown above in claim 1.

With respect to claim 55, Hung discloses, a MEMS (fig. 1b) comprising:

a flexure (26a/b in fig. 1b);

a voltage generator (18 in fig. 1b).

While Hung compensates for differences in a pixel plate length (col. 14, lines 11-14), Hung does not expressly disclose compensating the DLD for temperature variations.

Romo discloses, a temperature sensor (708 in fig. 12) thermally coupled to an optical MEMs device (fig. 3, for example), wherein said temperature sensor is configured to produce a temperature compensated voltage in response to a thermal measurement performed by said temperature sensor (col. 9, line 66 – col. 10, line 4)

Hung and Romo are analogous art because they are both from the same field of endeavor namely optical MEMS devices operating using electrostatic attraction.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the temperature sensor and compensation means of Romo in the DLD device of Hung.

The motivation for doing so would have been to overcome temperature dependent instabilities (Romo; col. 1, lines 46-48).

17. Claims 2-3, 5-9, 14-16, 18-22, 25-26, 28-29, 32-33, 35-38, 56 and 58-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hung et al. (US 6,329,738) in view of Romo et al. (US 7,197,225) and further in view of McCartney et al. (US 5,088,806).

With respect to claim 2, Hung and Romo disclose, the DLD of claim 1 (see above).

Neither Hung nor Romo expressly disclose, an offset voltage generator to generate a temperature compensated voltage.

McCartney discloses, a temperature sensor (52 in fig. 5) thermally coupled to a display device (50 in fig. 5), wherein said temperature sensor is configured to produce a temperature compensated voltage in response to a thermal measurement performed by said temperature sensor (col. 4, lines 18-30), further comprising;

an offset voltage generator (54-56 in fig. 5), wherein said offset voltage generator is configured to generate a temperature compensated offset voltage based on said thermal measurement (col. 3, lines 12-24.

Hung, Romo and McCartney are analogous art because they are both from the same field of endeavor namely, driving devices for multi-layer display devices that are temperature dependent.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the temperature sensor circuitry, taught by McCartney on the diffractive light device of Hung and Romo.

The motivation for doing so would have been to provide a more accurate and reliable displayed image (McCartney; col. 2, lines 22-43).

With respect to claim 3, Hung, McCartney and Romo disclose, the DLD of claim 2 (see above).

Hung further discloses, compensating for a change in spring force exerted on an optical plate by said flexure at measured lengths (col. 14, lines 11-14).

Additionally, Romo discloses, compensating for a change in flexibility of an optical fiber at a measured temperature (col. 9, line 66 – col. 10, line 4).

With respect to claim 5, Hung, Romo and McCartney disclose, the DLD of claim 2 (see above).

McCartney further discloses, wherein said offset voltage generator comprises:

a signal digitizer (54 in fig. 5) configured to digitize said thermal measurement;

a system controller (55 in fig. 5) communicatively coupled to said signal digitizer; and

a data storage device (55 in fig. 5) communicatively coupled to said system controller, wherein said data storage device contains a plurality of offset voltage value associated with said digitized thermal measurement (col. 3, lines 18-24).

With respect to claim 6, Hung, Romo and McCartney disclose, the DLD of claim 2 (see above).

McCartney further discloses, wherein said offset voltage generator comprises:

a signal digitizer (54 in fig. 5) configured to digitize said thermal measurement;

a system controller (55 in fig. 5) communicatively coupled to said digitizer, said system controller configured to combine said digitized thermal measurement to a uncompensated digital color count (command word in fig. 5); and

a digital to analog converter (56 in fig. 5) communicatively coupled to said system controller, wherein said digital to analog converter is configured to convert said combined digital signal into a thermally compensated analog voltage.

With respect to claim 7, Hung, Romo and McCartney disclose, the DLD of claim 2 (see above).

McCartney further discloses, a variable voltage source (56-57 in fig. 5) communicatively coupled to said offset voltage generator, wherein said variable voltage source is configured to generate a temperature compensated offset voltage in response to a command signal received from said offset voltage generator (col. 4, lines 27-30).

With respect to claim 8, Hung, Romo and McCartney disclose, the DLD of claim 2 (see above).

McCartney further discloses, a summing circuit, wherein said summing circuit is configured to combine said temperature compensated offset voltage with a color voltage bias (col. 4, lines 34-44) to produce said temperature compensated voltage.

With respect to claim 9, Hung, Romo and McCartney disclose, the DLD of claim 8 (see above).

McCartney further discloses, wherein said color voltage bias comprises a non-compensated voltage bias (col. 4, lines 30-33).

With respect to claims 14-16 and 18-22, these claims are seen as sufficiently equivalent to claims 2-3 and 5-9 to be rejected on the same merits shown above in the rejection of claims 2-3 and 5-9.

With respect to claims 25-26 and 28-29, these claims are seen as sufficiently equivalent to claims 2-3 and 5-9 to be rejected on the same merits shown above in the rejection of claims 2-3 and 5-9.

With respect to claims 32-33 and 35-38, these claims are seen as sufficiently equivalent to claims 2-3 and 5-9 to be rejected on the same merits shown above in the rejection of claims 2-3 and 5-9.

With respect to claims 56 and 58-60, these claims are seen as sufficiently equivalent to claims 2-3 and 5-9 to be rejected on the same merits shown above in the rejection of claims 2-3 and 5-9.

18. Claims 10-11, 23, 30, 39 and 61-62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hung et al. (US 6,329,738) in view of Romo et al. (US 7,197,225) and further in view of Mori et al. (US 5,903,251).

With respect to claim 10, Hung and Romo disclose, the DLD of claim 1 (see above).

Neither Hung nor Romo expressly disclose, a thermal sensor coupled to a DLD.

Mori discloses, a temperature sensor (5 in fig. 1), comprising a thermal sense resistor (thermistor; col. 4, line 18), thermally coupled to a display device (6 in fig. 1), wherein said temperature sensor is configured to produce a temperature compensated voltage in response to a thermal measurement performed by said temperature sensor (col. 4, lines 30-37).

Hung, Romo and Mori are analogous art because they are both from the same field of endeavor namely, compensating electro-optical devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the temperature sensor circuitry, taught by Mori on the diffractive light device of Hung and Romo.

The motivation for doing so would have been to provide a more accurate and reliable displayed image even when temperature distribution is present in the display panel (Mori; col. 2, lines 35-38).

With respect to claim 11, Hung, Romo and Mori disclose, the DLD of claim 10 (see above).

Mori further discloses, wherein said temperature sensor is configured to measure an average temperature of an array of pixels (col. 6, lines 30-45).

With respect to claims 23, 30, 39 and 61-62, these claims are seen as sufficiently equivalent to claims 10-11 to be rejected on the same merits shown above in the rejection of claims 10-11.

19. Claims 4, 17, 27 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hung et al. (US 6,329,738) in view of Romo et al. (US 7,197,225) and McCartney et al. (US 5,088,806) and further in view of Naiki et al. (US 7,038,654).

With respect to claim 4, Hung, Romo and McCartney disclose, the DLD of claim 2 (see above).

Neither Hung, Romo nor McCartney disclose, a low pass filter.

Naiki discloses, wherein an offset voltage generator comprises:

a buffer amplifier (OP2 in fig. 4; fig. 4 is a view of the temperature sensor circuit);

a low pass filter (13 in fig. 10) electrically coupled to said buffer amplifier (col. 11, lines 46-49); and

a scaler (14-15 in fig. 8) electrically coupled to said low pass filter (clear from fig. 8 that all the components are electrically coupled).

Naiki, Romo, Hung and McCartney are analogous art because they are all from the same field of endeavor namely, driving devices for multi-layer display devices that are temperature dependent.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the offset voltage circuitry taught by Naiki in the display device of Hung, Romo and McCartney.

The motivation for doing so would have been a more accurate temperature sensor with only a negligible measurement error (Naiki; col. 2, lines 1-4).

With respect to claims 17, 27 and 34, Hung, Romo and McCartney disclose, the DLD/MEMS of claims 16, 26 and 32 (see above).

These claims are seen as sufficiently equivalent to claim 4 to be rejected on the same merits shown above in the rejection of claim 4.

20. Claims 40, 42, 44-46, 49-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over McCartney et al. (US 5,088,806) in view of Hung et al. (US 6,329,738).

With respect to claim 40, McCartney discloses, a method of compensating for thermal effects in a LCD comprising:

measuring a temperature of said LCD (col. 4, lines 18-19);

generating a temperature compensated offset voltage (col. 4, lines 21-27) associated with an effect said temperature will have on said LCD (slow response time; col. 4, lines 9-15); and

producing a temperature compensated voltage on said LCD using said temperature compensated offset voltage, wherein applying said temperature compensated voltage to said LCD compensates for said thermal effects (col. 4, lines 27-30).

McCartney does not expressly disclose, compensating thermal effects in a DLD.

Hung discloses, compensating for increase in profile length by subsequently increasing the actuation force (col. 14, lines 12-14) in a diffractive light device (fig. 21; col. 27, lines 5-19).

Hung and McCartney are analogous art because they are both directed to the same problem solving area, driving devices for multi-layer display devices that are temperature dependent.

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the LCD of McCartney with the DLD of Hung for the well-known benefit of increased contrast possible with DLD devices.

With respect to claim 42, Hung and McCartney disclose, the method of claim 40 (see above).

McCartney further discloses, wherein said generating a temperature compensated offset voltage comprises:

providing said signal to an offset voltage generator (54-56 in fig. 5), wherein said offset voltage generator is configured to generate a temperature compensated offset voltage based on said signal (col. 3, lines 12-24).

With respect to claim 44, Hung and McCartney disclose, the method of claim 42 (see above).

McCartney further discloses, wherein said offset voltage generator comprises:

a signal digitizer (54 in fig. 5) configured to digitize said thermal measurement;

a system controller (55 in fig. 5) communicatively coupled to said signal digitizer; and

a data storage device (55 in fig. 5) communicatively coupled to said system controller, wherein said data storage device contains a plurality of offset voltage value associated with said digitized thermal measurement (col. 3, lines 18-24).

With respect to claim 45, Hung and McCartney disclose, the method of claim 42 (see above).

McCartney further discloses, wherein said offset voltage generator comprises:

a signal digitizer (54 in fig. 5) configured to digitize said thermal measurement;

a system controller (55 in fig. 5) communicatively coupled to said digitizer, said system controller configured to combine said digitized thermal measurement to a uncompensated digital color count (command word in fig. 5); and

a digital to analog converter (56 in fig. 5) communicatively coupled to said system controller, wherein said digital to analog converter is configured to convert said combined digital signal into a thermally compensated analog voltage.

With respect to claim 46, Hung and McCartney disclose, the method of claim 40 (see above).

McCartney further discloses, wherein said measuring a temperature of said DLD comprises:

thermally coupling a thermal sensor (52 in fig. 3) to a LCD (clear from fig. 5 that the temp sensor is coupled to the LCD); and

sensing a temperature of said LCD (clearly the temperature sensor, senses the temperature of the LCD)..

The combination of McCartney with Hung merely replaces the LCD with the DLD device of Hung. As such after the combination the temperature sensor of McCartney would be coupled with the DLD.

With respect to claim 49, Hung and McCartney disclose, the method of claim 40 (see above).

McCartney further discloses, a summing circuit, wherein said summing circuit is configured to combine said temperature compensated offset voltage with a color voltage bias (col. 4, lines 34-44) to produce said temperature compensated voltage.

With respect to claim 50, McCartney discloses, a processor readable medium (55 in fig. 5) having instructions thereon for:

sensing a temperature change of a LCD (col. 4, lines 18-20); and

modifying a voltage provided to said LCD in response to said sensed temperature change (col. 4, lines 21-33).

McCartney does not expressly disclose, sensing temperature changes specifically in a DLD.

Hung discloses, compensating for increase in profile length by subsequently increasing the actuation force (col. 14, lines 12-14) in a diffractive light device (fig. 21; col. 27, lines 5-19).

Hung and McCartney are analogous art because they are both directed to the same problem solving area, driving devices for multi-layer display devices that are temperature dependent.

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the LCD of McCartney with the DLD of Hung for the well-known benefit of increased contrast possible with DLD devices.

With respect to claim 51, Hung and McCartney disclose, the processor readable medium of claim 50 (see above).

McCartney further discloses, wherein said modifying a voltage provided to said DLD comprises:

receiving a signal associated with said sensed temperature change (output of 54 in fig. 5); and

generating a temperature compensated offset voltage based on said signal (col. 4, lines 27-30).

With respect to claim 52, McCartney and Hung disclose, the processor readable medium of claim 51 (see above).

McCartney further discloses, wherein said processor readable medium further has instructions thereon for:

digitizing said signal (54 in fig. 5);

providing said digitized signal to a data storage device (55 in fig. 5); and

receiving a temperature compensated offset voltage value from said data storage device (col. 3, lines 18-24).

With respect to claim 53, McCartney and Hung disclose, the processor readable medium of claim 52 (see above).

McCartney further discloses, wherein said data storage device comprises a data lookup table (col. 4, lines 23-27).

With respect to claim 54, McCartney and Hung disclose, the processor readable medium of claim 51 (see above).

McCartney further discloses, wherein said processor readable medium further has instructions thereon for:

digitizing said signal (54 in fig. 5);

combining said digitized signal with a digital color count (command word in fig. 5); and

converting said combined signal to an analog voltage (56 in fig. 5).

21. Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over McCartney et al. (US 5,088,806) in view of Hung et al. (US 6,329,738) and further in view of Romo et al. (US 7,197,225).

With respect to claim 41, McCartney and Hung disclose, the method of claim 40 (see above).

Neither Hung nor McCartney expressly disclose, that the thermal effect comprises a change in spring force exerted by a flexure on a pixel plate.

Romo discloses, that a thermal effect comprises a change in the actuation force necessary to affect a change in the cantilever (col. 1, lines 46-48; col. 4, lines 23-27; col. 10, lines 1-4).

Romo, Hung and McCartney are analogous art because they are both from the same field of endeavor namely, driving devices for multi-layer display devices that are temperature dependent.

At the time of the invention it would have been obvious to one of ordinary skill in the art to also compensate the DLD of Hung and McCartney for a change in spring force as taught by Romo.

The motivation for doing so would have been to overcome temperature dependent instabilities (Romo; col. 1, lines 46-48).

22. Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over McCartney et al. (US 5,088,806) in view of Hung et al. (US 6,329,738) and further in view of Naiki et al. (US 7,038,654).

With respect to claim 43, McCartney and Hung disclose, the method of claim 42 (see above).

Neither Hung nor McCartney disclose, a low pass filter.

Naiki discloses, wherein an offset voltage generator comprises:

a buffer amplifier (OP2 in fig. 4; fig. 4 is a view of the temperature sensor circuit);

a low pass filter (13 in fig. 10) electrically coupled to said buffer amplifier (col. 11, lines 46-49); and

a scaler (14-15 in fig. 8) electrically coupled to said low pass filter (clear from fig. 8 that all the components are electrically coupled).

Naiki, Hung and McCartney are analogous art because they are all from the same field of endeavor namely, driving devices for multi-layer display devices that are temperature dependent.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the offset voltage circuitry taught by Naiki in the display device of Hung and McCartney.

The motivation for doing so would have been a more accurate temperature sensor with only a negligible measurement error (Naiki; col. 2, lines 1-4).

23. Claims 47-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over McCartney et al. (US 5,088,806) in view of Hung et al. (US 6,329,738) and further in view of Mori et al. (US 5,903,251).

With respect to claim 47, Hung and McCartney disclose, the method of claim 46 (see above).

Neither Hung nor McCartney expressly disclose what type of temperature sensor is used.

Mori further discloses, wherein said temperature sensor comprises a thermal sense resistor (thermistor; col. 4, line 18).

Hung, McCartney and Mori are analogous art because they are both from the same field of endeavor namely, driving devices for multi-layer display devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the temperature sensor circuitry, taught by Mori on the diffractive light device of Hung.

The motivation for doing so would have been to provide a more accurate and reliable displayed image even when temperature distribution is present in the display panel (Mori; col. 2, lines 35-38).

With respect to claim 48, Hung and McCartney disclose, the method of claim 47 (see above).

Neither Hung nor McCartney expressly disclose measuring an average temperature of an array of DLDs.

Mori further discloses, wherein said temperature sensor is configured to measure an average temperature of an array of pixels (col. 6, lines 30-45).

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the temperature sensor circuitry, taught by Mori on the diffractive light device of Hung.

The motivation for doing so would have been to provide a more accurate and reliable displayed image even when temperature distribution is present in the display panel (Mori; col. 2, lines 35-38).

24. Claim 57 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hung et al. (US 6,329,738) in view of Romo et al. (US 7,197,225) and further in view of Naiki et al. (US 7,038,654).

With respect to claim 57, Hung and Romo disclose, the MEMS of claim 55 (see above).

Neither Hung nor Romo disclose, a low pass filter.

Naiki discloses, wherein an offset voltage generator comprises:

a buffer amplifier (OP2 in fig. 4; fig. 4 is a view of the temperature sensor circuit);

a low pass filter (13 in fig. 10) electrically coupled to said buffer amplifier (col. 11, lines 46-49); and

a scaler (14-15 in fig. 8) electrically coupled to said low pass filter (clear from fig. 8 that all the components are electrically coupled).

Naiki, Romo and Hung are analogous art because they are all from the same field of endeavor namely, driving devices for multi-layer display devices that are temperature dependent.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the offset voltage circuitry taught by Naiki in the display device of Hung and Romo.

The motivation for doing so would have been a more accurate temperature sensor with only a negligible measurement error (Naiki; col. 2, lines 1-4).

Conclusion

25. Any inquiry concerning this communication or earlier communications from the examiner should be directed to William L. Boddie whose telephone number is (571) 272-0666. The examiner can normally be reached on Monday through Friday, 7:30 - 4:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on (571) 272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Wlb
4/13/07

Sumati Lefkowitz

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